

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION RESEARCH AND TECHNOLOGY RESUME	
TITLE	
PLANETARY SPECTROSCOPY	
PERFORMING ORGANIZATION	
JET PROPULSION LABORATORY 4800 OAK GROVE DRIVE PASADENA, CA 91109	
INVESTIGATOR'S NAME	TEL. NO.
Bergstralh, J. T.	(818) 354-2296
DESCRIPTION (a. Brief statement on strategy of investigation; b. Progress and accomplishments of prior year; c. What will be accomplished this year, as well as how and why; and d. Summary bibliography)	

a. The goal of this task is to acquire physical data on the atmospheres of the outer planets and Titan by means of ground-based spectroscopy, spectrophotometry, and spectral imaging at visible to near-infrared wavelengths (approximately 0.3 to 2.5 microns). These data constrain physical parameters which characterize properties and distribution of aerosols in the atmospheres of these bodies. Work in the coming year will focus primarily on Neptune, to support the upcoming Voyager encounter with that planet. This task includes only data acquisition and reduction; analyses are performed under separate tasks.

b. Reduced spectral imaging of Neptune. The data were analyzed in several ways. Direct inspection of images reveals the distribution of discrete clouds in the atmosphere, which indicate that the global distribution of clouds has changed since earlier imaging. Disk-integrated photometry obtained from the images demonstrates that the diurnal variability at methane-band wavelengths is caused by the presence of discrete clouds; short-term variability is also seen in the rotational light curve, providing evidence for modification of cloud structure on the planet. The center-to-limb brightness profiles of the equatorial region of Neptune were analyzed, which provided constraints on the location, albedos, and optical depths of aerosol scattering layers in the troposphere and lower stratosphere.

c. (1) Three observing runs at Mauna Kea Observatory (University of Hawaii 2.24-meter telescope) to obtain CCD imaging at well-defined spectral bandpasses. These data, when combined with past observations, will provide a continuous series of photometrically calibrated data over a timescale of several years. One of the runs will be specifically requested to coincide with the Voyager encounter time. (2) Continued analyses of older data are also planned. (3) Report results at DPS meeting in Austin, TX.

d. Hammel, H.B. and M.W. Buie (1987). An atmospheric rotation period of Neptune determined from methane-band imaging. *Icarus* 72, 62-68.

Hammel, H.B. (1988). The atmosphere of Neptune studied with CCD imaging at methane-band and continuum wavelengths. Doctoral dissertation, University of Hawaii.

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